

What Is Claimed Is:

1. A backlight device for a liquid crystal display, comprising:  
  
    a substrate; and  
  
    a plurality of white, red, green, and blue light emitting diodes arranged on  
  
the substrate.
  
2. The device according to claim 1, wherein the white light emitting diodes are  
  
disposed between the blue and red light emitting diodes.
  
3. The device according to claim 1, wherein the plurality of white, red, green, and  
  
blue light emitting diodes are sequentially disposed in an order of white, red, green,  
  
and blue.
  
4. A backlight device for a liquid crystal display, comprising:  
  
    a light-guiding plate disposed at a rear of a liquid crystal display panel of  
  
the liquid crystal display;  
  
    at least one light source disposed along one side of the light-guiding plate,  
  
the light source including a plurality of light emitting diodes in order of white, red,  
  
green, and blue;

a housing disposed adjacent to the light-guiding plate for concentrating white, red, green, and blue light emitted from the light source along a first light direction; and

a reflecting plate disposed under the light-guiding plate for reflecting light leaking along a side of the liquid crystal display panel opposite to the light-guiding plate.

5. The device according to claim 4, wherein the light sources are disposed along two opposing sides of the light-guiding plate.

6. The device according to claim 4, wherein the housing includes aluminum.

7. The device according to claim 4, wherein the light emitting diodes each have light-emitting portions and body portions such that the housing surrounds the light-emitting portions of the plurality of light emitting diodes.

8. The device according to claim 7, wherein the housing is disposed between the light-emitting portions and the body portions of the plurality of light emitting diodes.

9. A backlight device for a liquid crystal display, comprising:

a main light-guiding plate disposed at a rear of a liquid crystal panel of the liquid crystal display;

at least one sub light-guiding plate disposed adjacent to an incident surface along one side of the main light-guiding plate;

at least one light source disposed along one side of the sub light-guiding plate, the light source includes a plurality of light emitting diodes in order of white, red, green, and blue;

a housing adjacent to the light-guiding plate for concentrating white, red, green, and blue light emitted from the light source along a first light direction; and

first and second reflecting plates disposed under the main light-guiding plate for reflecting light leaking along a side of the liquid crystal display panel opposite to the main light-guiding plate and the sub light-guiding plate.

10. The device according to claim 9, wherein the second reflecting plate includes aluminum coated with silver.

11. The device according to claim 9, wherein the sub light-guiding plate is disposed between the housing and the first and second reflecting plates.

12. A backlight device for a liquid crystal display, comprising:
- a first light source including a plurality of green, blue, and red light emitting diodes disposed on a substrate according to a first arrangement order along a first row direction; and
  - a second light source including a plurality of white light emitting diodes disposed on the substrate according to a second arrangement order along a second row direction,
- wherein the first row direction is different from the second row direction.
13. The device according to claim 12, wherein the first arrangement order includes a first periodic repeating order of the green, blue, and red light emitting diodes along the first row direction.
14. The device according claim 12, wherein each of the white diodes are disposed between each of the green and blue light emitting diodes, between each of the red and green light emitting diodes, and between each of the blue and green light emitting diodes.

15. A backlight device for a liquid crystal display, comprising:
- a light-guiding plate disposed at a rear of a liquid crystal display panel of the liquid crystal display;
  - a first light source disposed along at least one side of the light-guiding plate, the first light source includes a plurality of green, blue, and red light emitting diodes arranged along a first row direction;
  - a second light source disposed along at least the one side of the light-guiding plate, the second light source includes a plurality of white light emitting diodes arranged along a second row direction different from the first row direction;
  - a housing affixing the first and second light sources and concentrating light emitted from the first and second light sources along a first light direction; and
  - a reflecting plate disposed under the light-guiding plate for reflecting light leaking along a side of the liquid crystal display panel opposite to the light-guiding plate.
16. The device according to claim 15, wherein the first and second light sources are formed on a single substrate.
17. The device according to claim 15, wherein the housing includes aluminum.

18. The device according to claim 15, wherein the first and second light sources are each formed along both sides of the light-guiding plate.

19. The device according to claim 15, wherein the plurality of green, blue, and red light emitting diodes are arranged in a periodic repeating order of green, blue, and red along the first row direction.

20. The device according to claim 15, wherein each of the white light emitting diodes are arranged in a periodic repeating order between each of the green and blue light emitting diodes, between each of the red and green light emitting diodes, and between each of the blue and green light emitting diodes.

21. A backlight device for a liquid crystal display, comprising:

- a main light-guiding plate disposed at a rear of a liquid crystal display panel of the liquid crystal display;

- a sub light-guiding plate disposed on an incident surface along one side of the main light-guiding plate;

- a first light source disposed along at least one side of the sub light-guiding plate, the first light source includes a first periodic repeating order of a plurality of green, blue, and red light emitting diodes along a first row direction;

a second light source disposed along at least the one side of the sub light-guiding plate, the second light source includes a second periodic repeating order of a plurality of white light emitting diodes along a second row direction different from the first row direction;

a housing adjacent to the main light-guiding plate affixing the first and second light sources and concentrating light emitted from the first and second light sources along a first light direction; and

first and second reflecting plates disposed under the main light-guiding plate for reflecting light leaking along a side of the liquid crystal display panel.

22. The device according to claim 21, wherein the first and second light sources are bonded to a common substrate.

23. The device according to claim 22, wherein the common substrate is disposed perpendicular to a major surface of the main light-guiding plate.

24. The device according to claim 22, wherein the common substrate is disposed parallel to a major surface of the main light-guiding plate.

25. The device according to claim 21, wherein the second reflecting plate includes aluminum Al coated with silver.

26. A method of fabricating a backlight device for a liquid crystal display, comprising:

forming a light-guiding plate at a rear of a liquid crystal display panel of the liquid crystal display;

forming at least one light source along one side of the light-guiding plate, the light source including a plurality of light emitting diodes in order of white, red, green, and blue;

forming a housing adjacent to the light-guiding plate for concentrating white, red, green, and blue light emitted from the light source along a first light direction; and

forming a reflecting plate under the light-guiding plate for reflecting light leaking along a side of the liquid crystal display panel opposite to the light-guiding plate.

27. The method according to claim 26, wherein the forming of at least one light source includes forming a plurality of the light sources along two opposing sides of the light-guiding plate.



28. The method according to claim 26, wherein the light-emitting diodes each have light-emitting portions and body portions such that the step of forming the housing includes surrounding the light-emitting portions of the plurality of light emitting diodes.

29. The method according to claim 28, wherein the housing is disposed between the light-emitting portions and the body portions of the plurality of light emitting diodes.

30. A method of fabricating a backlight device for a liquid crystal display, comprising:

forming a main light-guiding plate at a rear of a liquid crystal display panel of the liquid crystal display;

forming at least one sub light-guiding plate adjacent to an incident surface along one side of the main light-guiding plate;

forming at least one light source along one side of the sub light-guiding plate, the light source includes a plurality of light emitting diodes in order of white, red, green, and blue;

forming a housing along the main light-guiding-plate for concentrating white, red, green, and blue light emitted from the light source along a first light direction; and

forming first and second reflecting plates under the main light-guiding plate for reflecting light leaking along a side of the liquid crystal display panel opposite to the main light-guiding plate and the sub light-guiding plate.

31. The method according to claim 30, wherein the sub light-guiding plate is disposed between the housing and the first and second reflecting plates.

32. A method of fabricating a backlight device for a liquid crystal display, comprising:

forming a first light source including a plurality of green, blue, and red light emitting diodes on a substrate according to a first arrangement order along a first row direction; and

forming a second light source including a plurality of white light emitting diodes on the substrate according to a second arrangement order along a second row direction,

wherein the first row direction is different from the second row direction.

33. The method according to claim 32, wherein the first arrangement-order includes a first periodic repeating order of the green, blue, and red light emitting diodes along the first row direction.

34. The method according claim 32, wherein each of the white diodes are disposed between each of the green and blue light emitting diodes, between each of the red and green light emitting diodes, and between each of the blue and green light emitting diodes.

35. A method of fabricating a backlight device for a liquid crystal display, comprising:

- forming a light-guiding plate at a rear of a liquid crystal display panel of the liquid crystal display;

- forming a first light source along at least one side of the light-guiding plate, the first light source includes a plurality of green, blue, and red light emitting diodes arranged along a first row direction;

- forming a second light source along at least the one side of the light-guiding plate, the second light source includes a plurality of white light emitting diodes arranged along a second row direction different from the first row direction;

forming a housing adjacent to the light-guiding plate for affixing the first and second light sources and concentrating light emitted from the first and second light sources along a first light direction; and

forming a reflecting plate under the light-guiding plate for reflecting light leaking along a side of the liquid crystal display panel opposite to the light-guiding plate.

36. The method according to claim 35, wherein the first and second light sources are formed on a single substrate.

37. The method according to claim 35, wherein the first and second light sources are each formed along both sides of the light-guiding plate.

38. The method according to claim 35, wherein the plurality of green, blue, and red light emitting diodes are arranged in a periodic repeating order of green, blue, and red along the first row direction.

39. The method according to claim 35, wherein each of the white light emitting diodes are arranged in a periodic repeating order between each of the green and blue light emitting diodes, between each of the red and green light emitting diodes, and between each of the blue and green light emitting diodes.

40. A method of fabricating a backlight device for a liquid crystal display, comprising:

forming a main light-guiding plate at a rear of a liquid crystal display panel of the liquid crystal display;

forming a sub light-guiding plate on an incident surface along one side of the main light-guiding plate;

forming a first light source along at least one side of the sub light-guiding plate, the first light source includes a first periodic repeating order of a plurality of green, blue, and red light emitting diodes along a first row direction;

forming a second light source along at least the one side of the sub light-guiding plate, the second light source includes a second periodic repeating order of a plurality of white light emitting diodes along a second row direction different from the first row direction;

forming a housing adjacent to the main light-guiding plate for affixing the first and second light sources and concentrating light emitted from the first and second light sources along a first light direction; and

forming first and second reflecting plates under the main light-guiding plate for reflecting light leaking along a side of the liquid crystal display panel.

42. The method according to claim 40, wherein the first and second light sources are bonded to a common substrate.

43. The method according to claim 42, wherein the common substrate is disposed perpendicular to a major surface of the main light-guiding plate.

44. The method according to claim 42, wherein the common substrate is disposed parallel to a major surface of the main light-guiding plate.